

Proteomics: Proteomics at the National Cancer Institute (Part 3 of 3)

Balintfy: In the past couple episodes of NIH Research Radio, we've been learning about proteomics, the study of proteins, and how it might help with personalized medicine, as well as the challenges facing the field of cancer research. Now, we wrap up our discussion with Dr. Henry Rodriguez, the director of the Clinical Proteomic Technologies for Cancer programs at the NCI. We'll focus on how proteins can be biomarkers.

Dr. Rodriguez: Correct.

Balintfy: And the National Cancer Institute is very involved in that. First, thanks again, and welcome back.

Dr. Rodriguez: Thank you very much.

Balintfy: Let's talk about how the National Cancer Institute is addressing the promise and some of the challenges we've been talking about regards to proteomics for the early detection, diagnosis, and treatment of cancer.

Dr. Rodriguez: Absolutely, so one of the things that the National Cancer Institute did is they held a series of workshops, and they absolutely recognize the promise that clinical proteomics can have for cancer. But at the same time, they also recognize that there's challenges and that the research community has to address and overcome. To that, what they did in late 2006, NCI had then launched the Clinical Proteomic Technologies for Cancer Initiative.

What the program is really doing, which is the reason I just think it's one of the best things that's out there and it's very unique, is that it brings together the best minds in proteomics to greatly improve the protein biomarker pipeline, and at the same time, it's doing this with a set of various tools, with the platforms, the various necessary reagents and the data for the field so that ultimately, proteomic biomarker discoveries can be translated into a clinic.

Balintfy: Basically, meaning there's going to be standardization and all this research will focus the standards so that information can be used in the future for potential treatments and—

Dr. Rodriguez: Exactly, and then the part that makes it very unique is that the products that we develop, the data that we generate, all this goes back to the public, so at the same time, they could actually look at what we're doing. Hopefully, our goal would be is that they would see the value in these metrics and start applying it within their own research laboratory.

Balintfy: And this is being done basically through some different programs?

Dr. Rodriguez: Right, so the program itself actually has three major but well-integrated components to it. One of them they refer to as the Clinical Proteomic Technology Assessment for Cancer commonly referred to as the CPTAC Network. And there's another one we have where we look at individual investigators, and that's one we refer to as Advance Platforms and

Computational Sciences. The third component is we're also developing a Proteomic Reagents and Resources Core.

Now, the CPTACs, which is the network, this actually represents one of the most in-depth, multi-disciplinary networks that I'm aware of that's actually trying to optimize existing platforms, again, to reliably identify, quantify and compare proteins in complex biological mixtures.

The second component becomes, what if it turns out that these analytical tools that the network is looking at might not be the most robust to go from a research environment, ultimately into a clinical setting. So what we did with at NCI is that the second component specifically targets individual investigators.

The third one happens to become what we refer to as the Proteomic Reagents and Resources Core. And what resources we imply there is that every standard operating procedure we develop, every data set that we will develop, that becomes the resource, and the reagents are going to be the antibodies and other things that will go back to the community. So those are the three well-integrated program itself.

Balintfy: What communities are involved in the NCI Clinical Proteomics Technologies for Cancer Initiative?

Dr. Rodriguez: So the initiative itself is referred to as the CPTC, the network of laboratories is what's referred to as the CPTAC. Now, when it comes to the community, I think this is one that's quite challenging, but at the same time, it's one of the most rewarding that I've been given the effort now to lead. It currently consists of scientists. Nearly, it looks at 50 federal, academic and private sector organizations.

What makes it quite interesting is that the researchers funded through this program, they represent both seasoned senior investigators who are leading large centers. But at the same time, we also involve junior investigators that's involved in the individual projects.

At the heart of the program is the one that you just alluded to, which is the CPTAC, and that's the network of laboratories, and what they do is that they actually help govern the overall initiative along with the other members of the program, and that's how we ensure that what the individual investigators are doing, they're informed of what the network is doing. The network is also able to tap into the products and deliverables that's coming out of the individual investigators but also they take into consideration what would the community at large need to further advance their science.

Balintfy: What do you think that is that the NCI Clinical Proteomic Technologies for Cancer Initiative is going to provide the community?

Dr. Rodriguez: So, kind of an easy way of looking at it is I actually would say that what the program is ultimately going to provide is the foundation for advancing protein science for personalized medicine. So how's it going to do that? Well, it's going to provide the necessary

optimized tools, the various metrics, methodologies, reagents, data, and the standards that's going to be needed to define the platform performance parameters and sources of variability at every step of the biomarker discovery and the verification pipeline.

In other words, kind of like this proteomics tool kit. You open it up, and here's all the things you're going to need to go into your laboratory and have assurance that all this is working correctly; and at the same time, developing collaboration with institutions and by the National Institute of Standards and Technology, which is a sister agent through the Department of Commerce out here in Maryland. We're also developing various resources and standards through them, because that is the federal arm of developing standards. And our goal is to provide these at very minimal cost to the greater community at large.

The main thing we really see out of it is that all this encompassing is going to dramatically improve the quality of biomarkers candidates that enter the clinic for validation, and we hope that's going to lay the foundation for the next generation of molecular diagnostic based tools, looking at proteins as the end product that you wish to measure.

Balintfy: I think that kind of wraps up this particular episode and at this moment, we're kind of wrapping up a series. Is there, you know, maybe some final words or is there something that maybe I've missed that we should cover?

Dr. Rodriguez: I think the main thing is that while the genomics community has developed very wonderful science, I think the proteomic community is in its infancy, but the potential and the promise of understanding the proteins, their function, and can you use them for early diagnosis, is what you're going to see in the next years if the due diligence is done correctly, it will have a tremendous impact when it comes to cancer care at the patient level.

Balintfy: Terrific. Thank you very much.

Dr. Rodriguez: You're welcome.

Balintfy: This was the third of three features with Dr. Henry Rodriguez at the NCI. To hear the previous segments, visit the NIH Research Radio archive page and check out episodes 80 and 81. For more information about the NCI Clinical Proteomic Technologies for Cancer Initiative, visit the website proteomics.cancer.gov. That's it for this episode of NIH Research Radio. Please join us again on Friday, May first when our next edition will be available for download. I'm your host, Joe Balintfy. Thanks for listening.